

THE OCCURRENCE OF PLANT PARASITIC NEMATODES IN THE ARID REGION OF SOUTH AUSTRALIA

There is little information on the occurrence of plant parasitic nematodes in arid South Australia. Twenty-four genera of plant nematodes from the area encompassing the Northern Flinders Ranges to Cape Jervis have been identified together with a relationship between the distribution of plant species and the distribution of plant nematodes¹. The distribution of plant species was related to rainfall. Following on from this work, a survey of the arid region (mean annual rainfall less than 250mm) was undertaken over a four year period (1983-1986).

The soil was sampled from under native vegetation, the nematodes extracted using a modified Baermann's funnel technique² and where possible the nematodes identified to species level. At many sites few mature female specimens were extracted, so identification to genus only was possible (Table 1).

There were several genera of fungal feeding tylenchids identified which included *Aphelenchus avenae*, *Aphelenchoides* sp., *Costlenchus* c.f. *costatus*, *Neotylenchus* s.l. *Tylenchus* s.l. and *Ditylenchus* sp. These are not included with the plant nematodes in Table 1. Twelve genera of plant nematodes were identified from the arid region as well as juveniles and males of the Heteroderidae which were not identifiable because of the absence of females or cysts.

The most widely distributed plant nematode was *Tylenchorhynchus tobari* (Sauer & Annells, 1981). Of the 374 sites sampled, 63% contained *T. tobari*. All other species occurred at less than 8% of the sites. More than one taxon was present in 26% of the sites and a similar percent of sites had no plant nematodes present. The arid

regions are an adverse environment for most organisms. To survive, organisms must be drought resistant and also respond rapidly to the stimulus of rainfall. Some nematodes are ideally suited to the arid region as they can form an anhydrobiotic state in which metabolic respiration is greatly reduced but are quick to revive with addition of water³ and begin to reproduce rapidly after revival.

T. tobari (Sauer & Annells, 1981) is a widely distributed nematode within the region and must be well adapted to the environment. The species was first described from a site near Wentworth, N.S.W.⁴. The species was cultured by planting seeds of certain species of Chenopodiaceae (a common family in arid Australia) into soil known to contain *T. tobari*.

Studies of host/parasite relationships and environmental effects on nematode population growth will be presented in detail in another paper.

¹ Reay, F. & Wallace, H. R. (1981) *Nematologica* 27, 319-329.

² Schindler, A. F. (1961) *Plant Disease Reporter* 45, 747-748.

³ Freckman, D. W., Whitford, W. G. & Steinberger, Y. (1987) *Biology and Fertility of Soils* 3, 3-10.

⁴ Sauer, M. R. & Annells, C. M. (1981) *Nematologica* 27, 422-431.

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TABLE 1. Number and percent of sites from which plant nematodes (PP) were extracted in the years 1983 to 1986 inclusive.

Genus and Species	Sites Sampled	Percent of Total Sites
<i>Tylenchorhynchus tobari</i> Sauer & Annells, 1981	237	63.3
<i>Pratylenchus</i> sp.	24	6.4
<i>Morulaimus</i> sp.	16	4.3
<i>Helicotylenchus</i> sp.	16	4.3
<i>Scutellonema</i> sp.	16	4.3
<i>Radopholus</i> sp.	14	3.7
<i>Tylenchorhynchus velatus</i> Sauer & Annells, 1981	12	3.2
<i>Tylenchorhynchus</i> sp.	12	3.2
<i>Rotylenchus</i> sp.	7	1.9
<i>Hoplolaimus</i> sp.	7	1.9
<i>Morulaimus geniculatus</i> Sauer, 1966	5	1.3
<i>Paralongidorus</i> sp.	4	1.1
Heteroderidae males and juveniles	3	0.8
<i>Scutellonema laeviflexum</i> Phillips, 1971	3	0.8
<i>Tylenchorhynchus unnotatus</i> (Cassidy, 1930) Golden, 1971	3	0.8
<i>Scutellonema minutum</i> Sher, 1964	2	0.5
<i>Telotylenchus hastulatus</i> (Golden, 1960) Siddiqi, 1963	1	0.3
<i>Helicotylenchus variabilis</i> Phillips, 1971	1	0.3
<i>Radopholus crenatus</i> Colbran, 1971	1	0.3
<i>Paratylenchus</i> sp.	1	0.3
<i>Hemicyclophora</i> sp.	1	0.3
Total number of sites sampled	374	100.0
Sites with >1 genera of PP	97	25.9
Sites with PP	276	73.8
Sites without PP	98	26.2